HEIDENHAIN

Installation and
Operating Instructions

DataPilot
MANUALplus 620
CNC PILOT 620

English (en)
4/2011

1 DataPilot

1.1 Range of Application

Intended for use with the **MANUALplus 620** and **CNC PILOT 620** controls, respectively, the PC programs DataPilot MP620 and DataPilot CP620 enable you to create NC programs on a PC, test them before execution, transfer them to the control, and archive them after production is concluded.

DataPilot can be used for shop-floor programming **as well as** for office and off-location program creation and testing. Its practicality and wide range of functions also make DataPilot ideal for training purposes.

The functions of the WINDOWS operating system are the perfect complement for the operation and organizational possibilities of DataPilot. For example, you can use network functions for data exchange between the control and a PC with DataPilot.

This manual describes functions and features provided by the DataPilot as of the following NC software levels.

Software	NC software number
DataPilot MP620	634 132-03 SP1
DataPilot CP620	729 665-01 SP1

The programming station software is fully compatible with the following controls.

Control	NC software number
MANUALplus 620	548 328-03 SP2
CNC PILOT 620	688 945-01 SP2

Many machine manufacturers and HEIDENHAIN offer programming courses. We recommend these courses as an effective way of enhancing your programming skill and sharing information and ideas with other users.

> **User documentation:**
>
> All of the control functions are described in the User's Manuals. Please contact HEIDENHAIN if you need a copy of these User's Manuals.
>
> If you have purchased the complete version of the programming station, you will find all user documentation on the CD (as PDF files) included in delivery.

1.2 Conversational Languages

You can operate DataPilot MP620 in the following conversational languages:

- German
- English
- French
- Italian
- Spanish
- Portuguese
- Dutch
- Danish
- Swedish
- Norwegian
- Finnish
- Russian
- Czech
- Slovak
- Polish
- Slovenian
- Turkish
- Romanian
- Hungarian
- Lithuanian
- Latvian
- Estonian
- Chinese (traditional)
- Chinese (simplified)
- Korean

DataPilot starts in the language used during the installation process. The language can be switched during operation by editing the respective parameter setting (see "Editing Protected Parameters" on page 16).

1.3 Documentation

These Operating Instructions contain information on the installation and specific features of DataPilot. The MANUALplus 620 (ID 634 864-xx) and CNC PILOT 620 (ID 730 870-xx) User's Manuals provide more detailed information on NC programming and the control functions. More information is available in the User's Manual for smart.Turn and DIN PLUS Programming (ID 685 556-xx).

You will find the User's Manuals in various languages on the DataPilot CD-ROM or on the Internet at www.heidenhain.de.

1.4 License and Hardware Key (Dongle)

You will find the HEIDENHAIN license and usage conditions for the software on the DataPilot CD on the Internet under **www.heidenhain.de/licence**.

If you wish to use the full version of DataPilot, you need a dongle. HEIDENHAIN supplies the following dongles:

- **Local dongle:** The dongle permits you to run DataPilot on a PC.
- **Network dongle:** The dongle is plugged into a USB port of the dongle server. Several DataPilot applications use this one dongle.

The dongle supplied authorizes you to use the DataPilot MP620 software or DataPilot MP620 software. Replacement dongles will be supplied only for the full price of the program. Defective dongles returned to HEIDENHAIN will of course be exchanged.

1.5 System Requirements

The DataPilot software runs on PCs with the following operating systems:

- WINDOWS XP
- WINDOWS Vista
- WINDOWS 7

Screen/graphics: 1024 x 768 pixels; > 256 colors

2 Installation and Uninstallation

2.1 Installing the Software

> First install the software, and then connect the dongle after software installation is complete.

If you do not use the automatic startup feature of the CD, install the DataPilot software as follows:

▶ Insert the DataPilot CD-ROM.

▶ Run "\JH\DP_MP620\setup_DataPilot_MP620.exe" or "\JH\DP_MP620\setup_DataPilot_CP620.exe" from the CD-ROM. The installation of the DataPilot software is dialog-guided and automatic.

Information on the settings during installation:

■ `Configuration selection:` Define the following details of your configurations.

   ■ **Multifix configuration:** Lathe with simple tool holder (Multifix)

   ■ **Turret configuration:** Lathe with tool turret

   ■ **Turret + Multifix configuration:** Lathe with tool turret and additional simple tool holder (Multifix)

■ **With Y axis:** Lathe with a Y axis

■ **Install Examples:** Set whether example programs are to be installed.

■ **Name of the logical machine:** This name is used as the name of the directory and the name of the desktop icon. If you want to install DataPilot more than once, you must use different names.

■ **Select Additional Tasks** dialog:

   ■ **Create a desktop icon:** Select whether the installation program is to create a desktop icon.

   ■ **Full version** or **Demo version:** The demo version provides only limited memory functions. You can create cycle programs with up to 6 cycles, and smart.Turn or DIN PLUS programs with up to 100 NC blocks. The demo version does **not** require a dongle. All functions are fully enabled in the full version. The full version requires a dongle.

   ■ **Local dongle:** The dongle is plugged into a USB port of the DataPilot PC.

   ■ **Network dongle:** The DataPilot PC does not require a local dongle. The dongle server must be active for DataPilot to run.

■ Information about **Firewall settings:** The installation program informs you here of which applications you may grant access.

In addition to the actual DataPilot software, the CRYPTO BOX support is installed for operating the dongle.

You may start DataPilot once installation has finished.

> ■ You need **administrator rights** in order to install DataPilot.
> ■ The DataPilot software must be installed on each PC on which DataPilot is to be run, including PCs that use a network dongle.

Conversational languages

The language you selected in the `Select Setup Language` dialog box is in effect when DataPilot is started for the first time. You can change the conversational language at any time during operation by editing the respective parameter setting (see "Editing Protected Parameters" on page 16).

Example programs, operating resource data

The DataPilot installation program transfers cycle and smart.Turn programs, as well as tool descriptions, to the PC if you activated this for the installation. The names of the example programs are PGMxx.gmz or PGMxx.nc (xx: 01, 02, ...). The technology data for several workpiece-material/tool-material combinations is transferred regardless of your settings. Use these standard values when entering the cutting values used by your organization.

Installing DataPilot more than once

If you want to install DataPilot more than once, you must give the DataPilot machines different names in **Name of the logical machine.** Each installation will create an independent DataPilot machine. This means that all NC programs, parameters, operating resources and the selected conversational language apply only to one specific DataPilot.

With this model, you support several different lathes at the same time and organize the work with DataPilot according to your requirements.

Software version

Should you need to contact our Service department, please be prepared to state the version number of your DataPilot software. To call the version number, select the **Organization mode** of operation and press the soft key with the key symbol. DataPilot will open a dialog box with information on the software version.
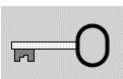
▶ Press the soft key

2.2 Uninstalling the Software

To remove the DataPilot software:

▶ In the Windows Start menu, select "Start > All Programs > HEIDENHAIN > DataPilot MP620 (634 132-02) or DataPilot CP620 (729 665-01)"

▶ ... and the name of the DataPilot software to be removed, and "Uninstall DataPilot ..."

Since the dongle driver was installed independently of DataPilot, it must be uninstalled separately.

▶ Start the program CBUSetup.exe (directory for DataPilot MP620: C:\Programme\HEIDENHAIN\DP620_634132-02\[Name of the DataPilot]) or (directory for DataPilot MP620: C:\Programme\HEIDENHAIN\DP620_729 665-01\[Name of the DataPilot]).

▶ Select Uninstall in the Select Mode dialog box and press OK.

> All DataPilot installations share the same dongle driver. Do not uninstall the driver unless you no longer want to use DataPilot on your PC.

2.3   Dongle Server

If you use a network dongle, the computer on which you install and run the server programs is called the "dongle server." The dongle is connected to this computer.

When you start DataPilot, the DataPilot PCs log on to the dongle server. During operation the server checks whether a logged-on DataPilot is active. If the DataPilot PC has not contacted the dongle server for some time, the dongle server logs that PC off (default setting: 15 minutes). When you exit DataPilot, your PC logs off from the dongle server.

Installing the server program

The server programs are installed from a local directory of the dongle server PC. Proceed as follows:

▶ Insert the DataPilot CD-ROM.
▶ Copy the **CBServer** directory (including all files) from the CD to a local drive of your PC (CD directory: \JH\CBServer).
▶ Start the server installation by entering "CBIOSSrv.exe /i /s" for the Run command.
▶ Set the CBIOSSRV.SRV program (directory: CBServer) as an exception in the Windows firewall software.

Server administration utility

The server administration program provides an overview of the DataPilot activities and includes administrative functions.

▶ Start the AdminApp.exe program (directory: CBServer).

You will find more information on the server administration program in the readme.txt file (directory: CBServer).

2.4 Adapting DataPilot to the Machine

Your machine manufacturer can provide you with a file that you can use to adapt DataPilot to your machine. The file must be available as a ZIP file and contains relevant data of your machine.

The installation of the machine data is referred to as **OEM-AddON**. The functions for installing, uninstalling and generating the **OEM-AddON** are located in the submenu of the start menu in which the programming station was also installed.

Installing the OEM AddON

The **Install OEM-AddON** function starts the installation procedure. Before the installation procedure starts you can select the installation file.

Uninstalling the OEm AddON

The **Uninstall OEM-AddON** function undoes the most recently performed installation process.

Generating the OEM AddON

The **Generate OEM-AddON** function creates a new ZIP file. You can select to either archive the contents of the `OEM:` drive (machine manufacturer) or the `TNC:` drive (user).

To generate an **OEM-AddON**:

▶ Install DataPilot

▶ In DataPilot, install the PLC and all relevant configuration data of your machine

▶ Check the machine-specific functions of the programming station (e.g. PLC, axes, spindles, M functions, coolant circuit)

▶ Select the **Generate OEM-AddON** function in the start menu to generate an installation file

3 DataPilot Operation

3.1 Starting/Exiting DataPilot

To **start** DataPilot:
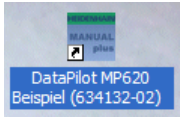
▶ Double-click the DataPilot icon

or

▶ Select the Windows Start menu: Start > All programs >
HEIDENHAIN > DataPilot MP620 (634 132-02) > xxx >
DataPilot MP620 (634 132-02) or Start > All Programs >
HEIDENHAIN > DataPilot CP620 (729 665-01) > xxx >
DataPilot CP620 (729 665-01) (xxx = name of the DataPilot
machine).

▶ Press the Num Lock key to activate the numeric keypad.

> The numerical lock must be active because the menu
> items are selected from the numeric keypad.

To **exit** DataPilot:
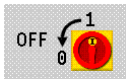
▶ Press the **Off** soft key

or

▶ Click **Shut Down** in the DataPilot Control Panel.

3.2 DataPilot Control Panel

When DataPilot is started, the DataPilot Control Panel is activated and
the associated DataPilot icon is displayed in the system tray. The
status of DataPilot is displayed in the Control Panel. The DataPilot
program can also be stopped, restarted after a stop or shut down via
the Control Panel.

If you press the **More** button, the size of the Control Panel increases,
and more buttons become visible. Press the **Settings** button to open
a dialog, to switch between local and network dongle, or to select
another server.

3.3 Keyboard

DataPilot is operated through function keys and numerical keys of the PC keyboard. You can also use the mouse to select the soft keys and many other functions. The keyboard strip gives you an overview of the meaning of the keys. The keyboard strip is available as a PDF file on the DataPilot CD-ROM (directory: ...\pdf\DP_MP620_Tastaturstreifen.pdf).

The **soft keys** (in the bottom section of the screen) are operated with the function keys F1 through F8 on your PC keyboard.

The following assignment applies:

■ F1 on your PC keyboard corresponds to the leftmost soft key.
■ F8 on your PC keyboard corresponds to the rightmost soft key.

Control keyboard		PC keyboard	Control keyboard		PC keyboard
	Soft key (SK1)	F1		S override –	Shift + F1
	Soft key (SK2)	F2		S override +	Shift + F2
	Soft key (SK3)	F3		F override –	Shift + F3
	Soft key (SK4)	F4		F override +	Shift + F4
	Soft key (SK5)	F5		Machine operating modes	Shift + F9
	Soft key (SK6)	F6		Programming modes	Shift + F10
	Soft key (SK7)	F7		Tables for tool data and technology data	Shift + F11
	Soft key (SK8)	F8		Organization modes	Shift + F12
	Switches to the soft-key menu at left	F9		Numeric keys	Numeric keypad of PC
	Switches to the soft-key menu at right	F10		Arrow keys; Pg Up, Pg Dn	Arrow keys of PC keyboard
	Switches the help graphics in the cycle programming between outside and inside machining	F11	ERR	Opens the error window	Alt + F7
	smart.Turn: Switches to the next detail input form	Ctrl + Page Down	CALC	Starts the on-screen calculator if the cursor is located in the corresponding input field.	Alt + C
	smart.Turn: Switches to the next group	Alt + Ctrl + Down arrow key	i	Displays additional information in the parameter editor	Alt + H

Control keyboard		PC keyboard	Control keyboard		PC keyboard
	smart.Turn: Switches to the previous group	Alt + Ctrl + Up arrow key		Deletes the character to the left of the cursor	Backspace
	S override to 100%	Ctrl + F1		Deletes the selected area	Del
	F override 100%	Ctrl + F3		Switchover between positive and negative values	Plus or Minus key
	Cycle stop	Ctrl + F5		Cancelation of dialogs and next higher menu level	Esc key
	Cycle start	Ctrl + F7		OK in dialogs and new NC blocks in the editor	Ins key
	Emergency stop	Ctrl + F8		Cursor jumps to the beginning of the program or list	Home key
	M3 spindle	Ctrl + F10		Cursor jumps to the end of the program or list	End key
	Spindle STOP	Ctrl + F11			
	M4 spindle	Ctrl + F12			

4 Parameter Settings

In the machine parameters, you define the conversational language, the simulation settings, the default values for smart.Turn and other data for your DataPilot machine. Parameters that are important for your daily work can be edited without code number. Configuration parameters cannot be edited unless you have logged on with a code number or password.

4.1 Applying Parameters from the Machine

If you use DataPilot as a programming system, HEIDENHAIN recommends using the same configuration as on your lathe. In order to do so, load the parameters and operating resource data (tool descriptions, technology data) from the lathe to DataPilot.

On the lathe:

▶ Log on with the code number **123** (Organization mode).
▶ Create a parameter backup file and a tools backup file (the tools backup file includes the technology data).
▶ Transfer the backup files to the DataPilot PC.

On the DataPilot PC:

▶ Log on with the password **config** (Organization mode).
▶ Perform a tools restore with the operating resource data of the lathe.
▶ Perform a parameters restore with the parameters of the lathe. The restore overwrites all parameters, including the PLC parameters.
▶ Perform another parameters restore, this time with the **PA_DP_PLC** parameters file, in order to restore the PLC parameters of DataPilot.

If you restart DataPilot now, the configurations will be the same as on the lathe.

> DataPilot uses a special PLC program and adapted PLC parameters. That is why you must reload the DataPilot's PLC parameters (PA_DP_PLC file) after applying the parameters from the lathe.

4.2 Changing Parameters

Parameter organization: The parameters are arranged in a tree structure. An icon at the beginning of each line in the parameter tree shows the meaning of the line.

Symbol	Meaning
⊞🗀	Parameter object, branch is closed.
⊟🗁	Parameter object, branch is open. The associated parameter objects or machine parameters are listed below this line.
▭	(Editable) machine parameters.

Refer to the "Parameters" chapter in the User's Manual.

▶ **Selecting a parameter:** Click the + or – symbol next to a parameter object to open or close the branch. As an alternative, use the arrow keys (Up/Down/Left/Right arrow key) to select the desired parameter.

▶ **Editing a parameter:** Place the cursor on the machine parameter to be edited and press RETURN (or the Right arrow key). DataPilot will open the dialog for editing the parameter.

STORE ▶ Press the soft key after the parameter has been edited. (The changes made will not take effect until they have been saved.)

4.3 Editing Parameters without a Code Number

▶ Switch to the **Organization** mode of operation.

USER PARAMETER ▶ Press the soft key

▶ Edit and save the parameter
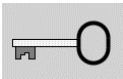
END ▶ Exit the parameter editor

The following table lists the parameters relevant to DataPilot.

Function	Parameter object	Explanation
Unit of measure for display and operation	System Definition of unit of measure in effect for display Unit of measure for display and user interface	Select the metric or inch system.

Simulation:
■ **Repetition**
■ **Delay/Accelerate**
	Simulation
	   General settings
	      Restart with M99
	      Path delay
		■ Set whether the simulation is to be repeated if M99 is programmed.
		■ Define the delay time after path output (default: 0 sec). This delays/accelerates the simulation of the machining process.

Simulation – Time calculation: Duration of switching functions	Simulation
	   Machining times for the NC functions in general
	      Time allowance for tool change
	      Time allowance for gear shifting
	      General time allowance for M function
		The times specified for tool change, gear shifting and M functions are taken into account in the time calculation for the simulation (default: 0 sec).

Simulation – Time calculation: Duration of M functions	Simulation
	   Machining times for M functions
	      T01
	         Number of the M function
	         Machining time of the M function
	      T02
	      ...
		Enter the number of the M function and the time to be taken into account for the M function (default: 0 sec). For the specified M functions, the times entered are added to the "General time allowance for M function."

Simulation: Window size	Simulation
	   Specification of the (standard) window size
	      Zero position in X
	      Zero position in Z
	      Delta X
	      Delta Z
		Zero position in X/Z allows you to define the position of the coordinate system in the simulation window (distance of the coordinate origin from the lower or left window edge). In **Delta X/Z** you define the vertical and horizontal expansion of the workspace in the simulation window.
		
		This data refers to the standard window size. You can adjust the settings at any time during simulation.

Simulation: Size of the workpiece blank	Simulation
	   Specification of the (standard) workpiece blank
	      Outside diameter
	      Length of the blank
	      Right edge of blank
	      Inside diameter
		Use **Outside diameter** and **length of the blank part** to define the size of the standard blank part. **Right edge of blank** determines the position of the workpiece blank in the simulation window, and **Inside diameter** determines the inside diameter if the workpiece blank is a tube.
		
		The standard workpiece blank is used in the simulation if no workpiece blank is defined.

General safety clearances	Processing
	   General settings
	      External safety clearance (SAR)
	      Internal safety clearance (SIR)
	      External on machined part (SAT)
	      Internal on machined part (SIT)
		■ **External/Internal safety clearance (SAR/SIR)** defines the external or internal safety clearance from the workpiece blank (default: 3 mm).
		■ **External/Internal on machined part (SAT/SIT)** defines the external or internal safety clearance from the machined part (default: 2 mm).

Function	Parameter object	Explanation
Default values for smart.Turn	Processing 　General settings 　　G14 for new units 　　Coolant for new units 　　G60 for new units 　　Safety clearance G47 　　Safety clearance, G147 infeed dir. 　　Safety clearance G147 plane 　　Oversize in X direction 　　Oversize in Z direction	In the following parameters you define the default values used by smart.Turn in the start unit. ■ **G14 for new units:** Strategy for approaching the tool change position (default: 0: simultaneous) ■ **Coolant for new units:** Definition of the coolant circuit (default: 1: Circuit 1 on) ■ **G60 for new units:** Protection zone active/inactive (default: 0: active) ■ **Safety clearance G47:** Safety clearance G47 (default: 2 mm) ■ **Safety clearance G147 infeed dir.:** Safety clearance G147 – Milling plane (default: 2 mm) ■ **Safety clearance G147 plane:** Safety clearance G147 – Infeed direction (default: 2 mm) ■ **Oversize in X direction:** Oversize in X direction (default: 0.5 mm) ■ **Oversize in Z direction:** Oversize in Z direction (default: 0.2 mm)

4.4 Editing Protected Parameters

▶ Switch to the **Organization** mode of operation.

▶ Press the soft key

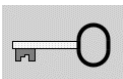▶ Enter the code number **123.**

▶ Edit and save the parameter

END
▶ Exit the parameter editor

The following table lists the parameters relevant to DataPilot.

Function	Parameter object	Explanation
Set the conversational language	NC and PLC conversational language settings NC conversational language PLC conversational language PLC error message language Help language	Here, you define the conversational language. DataPilot differentiates between the language for the NC dialog, the language for the PLC, the language for the error messages and the language for the help texts.

4.5 Editing Configuration Parameters

▶ Switch to the **Organization** mode of operation.

▶ Press the soft key

▶ Enter the password **config**

CONFIG
DATA
▶ Call the configuration parameters

▶ Edit and save the parameter

END
▶ Exit the parameter editor

> The password **config** only works for DataPilot, and not for the control of your machine.

The following table lists the parameters relevant to DataPilot.

Function	Parameter object	Explanation

Set the coordinate system	System
	  DisplaySettings
	    CfgCoordSystem
	      CoordSystem
		Here you set the coordinate system of the lathe.
		
		■ +X, +Z: Horizontal lathe; tool carrier behind the center
		■ –X, +Z: Horizontal lathe; tool carrier in front of center
		■ +Z, +X: Vertical lathe (vertical boring and turning mill), tool carrier to the right of center

Set the number of turret swivel positions	Aggregates
	  ToolHolder
	    TH1_REV
	      CfgTHDescription
	        maxSwivelPosition
		Here you set the maximum swivel position (number of swivel positions) of the tool turret.

Set the limit switches of the axes	Axes
	  ParameterSets
	    PX1_0
	      CfgPositionLimits
	        swLimitSwitchPos
	        swLimitSwitchNeg
	    PY1_0
	      ...
	    PZ1_0
	      ...
		Here you set the positive and negative limit switch positions of the linear axes.

5 Data Backup, Directory Structure

5.1 Data Backup

You should make regular backup copies of your NC part programs, operating resource data, and parameter settings. Use the DataPilot transfer functions for this. Your User's Manual ("Organization Operating Mode – Transfer – Create Data Backup") provides more detailed information on data backup.

The DataPilot software does not change after installation. There is no need to make backups of program files. If for any reason the program is damaged on the PC, you can simply reinstall DataPilot and continue working.
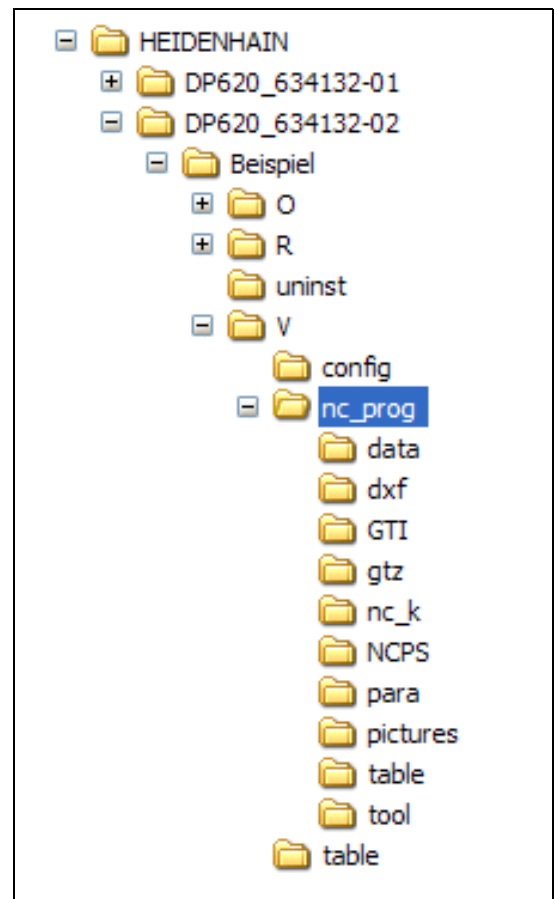
5.2 Directory Structure

During installation, you must indicate the path in which DataPilot is to be stored. The installation program creates the directory V \nc_prog and the subdirectories GTI, GTZ and NCPS beneath the DataPilot machine (see directory structure in illustration at right).

The directories contain the following files:

- GTI: ICP contour descriptions
    - *.gmi: Turning contours
    - *.gmr: Contours of workpiece blanks
    - *.gms: Contours of the front face
    - *.gmm: Contours of the lateral surface
- GTZ: Cycle programs
- NCPS: smart.Turn and DIN PLUS programs
    - *.nc: NC main programs
    - *.ncs: NC subprograms

More information: See User's Manual ("Organization Operating Mode – Transfer" chapter).

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